

# RESEARCH PROGRESS REPORT FOR THE QUARTER ENDING: 1st

Wisconsin Department of Transportation  
DT1241 2009

Research, Development and Technology Transfer	
<b>Program:</b> (Choose One) <input type="checkbox"/> Policy Research <input type="checkbox"/> Pooled Fund TPF # <input checked="" type="checkbox"/> Wisconsin Highway Research Program <input type="checkbox"/> Other	
<b>Project Title:</b>	
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<b>Project Investigator/Phone # (agency &amp; contact):</b> James Schneider (jamess@cae.wisc.edu) 608-890-2662	<b>Approved Starting Date:</b> 2/5/2009
<b>WisDOT Comments:</b>	<b>Original End Date:</b> 2/5/2012
	<b>Current End Date:</b> 2/5/2012
<b>Sponsor:</b> Wisconsin Department of Transportation	<b>Number of Extensions:</b>

## Schedule Status:

- ☐ On schedule ☐ Ahead of schedule  
☒ On revised schedule ☐ Behind schedule (Please explain below)

Total Project Budget	Expenditures Current Quarter	Total Expenditures	% Funds Expended	% Work Completed
\$109,893.00	\$9,957.82	\$32,492.51	29	20%

## Project Description:

The overall research objective of this study is to produce a document summarizing simplified design procedures for evaluation of foundation movements for transportation structures within the LRFD framework. Recommendations for the measurement and selection of input parameters for those design procedures will also be provided.

Progress This Quarter: (Includes project committee meetings, work plan status, contract status, significant progress, etc.)

The project consists of five main tasks (1) Literature Review and Database Development; (2) Field Monitoring of Shallow Foundations; (3) Field Monitoring of Deep Foundations; (4) Field Monitoring of Laterally Loaded Piles; and (5) Data Compilation and Analysis. Tasks this quarter have focused on site selection, instrumentation plan, development and calibration of instrumentation that will be applied in stages 2, 3, and 4, as well as instrumentation installation at Site 1. The discussion in this report will focus on layout and instrumentation of Site 1.

## Site 1:

Site 1 is part of State Project number 1030-20-71 at Bridge B-40-0820. A meeting was held at WisDOT with Jeff Horsfall on Tuesday 9 March to discuss instrumentation options. Figure 1 illustrates the profile of soil conditions and resistance across the site. There are two abutments and three piers. At each pier there are 6 columns with 15ft wide square footings.

Available budget allowed for approximately \$2000 of instrumentation. It was decided to measure load at one column location, and four Geokon sisterbar strain gauges were ordered along with a remote data acquisition system and protective case, as outlined below:

- (\$1159+shipping) Model 4911 VW Rebar Strainmeter, "Sister Bar" #4 rebar (with 20ft 02-250V6-E cable attached to each)
- (\$1083+shipping) Model 8002-4-1 LC-2 Datalogger, 4-channel, RS-232
- (\$145) Pelican™ iM2200 Storm Case iM2200-Yellow

Instrumentation is shown in Figure 2. A total cost of approximately \$2500, was accrued for this site, or 25% over budget.

Due to lead time for manufacturing instrumentation, Column 5 of Pier 3 was instrumented for measurement of load. Pier 3 appears to have the thinnest layer of underlying clay, and therefore may experience smaller settlements than other pier locations. Instruments were installed on Thursday 1 April, and will be attached to the logging system at the time the column is poured (approximately 9 April).

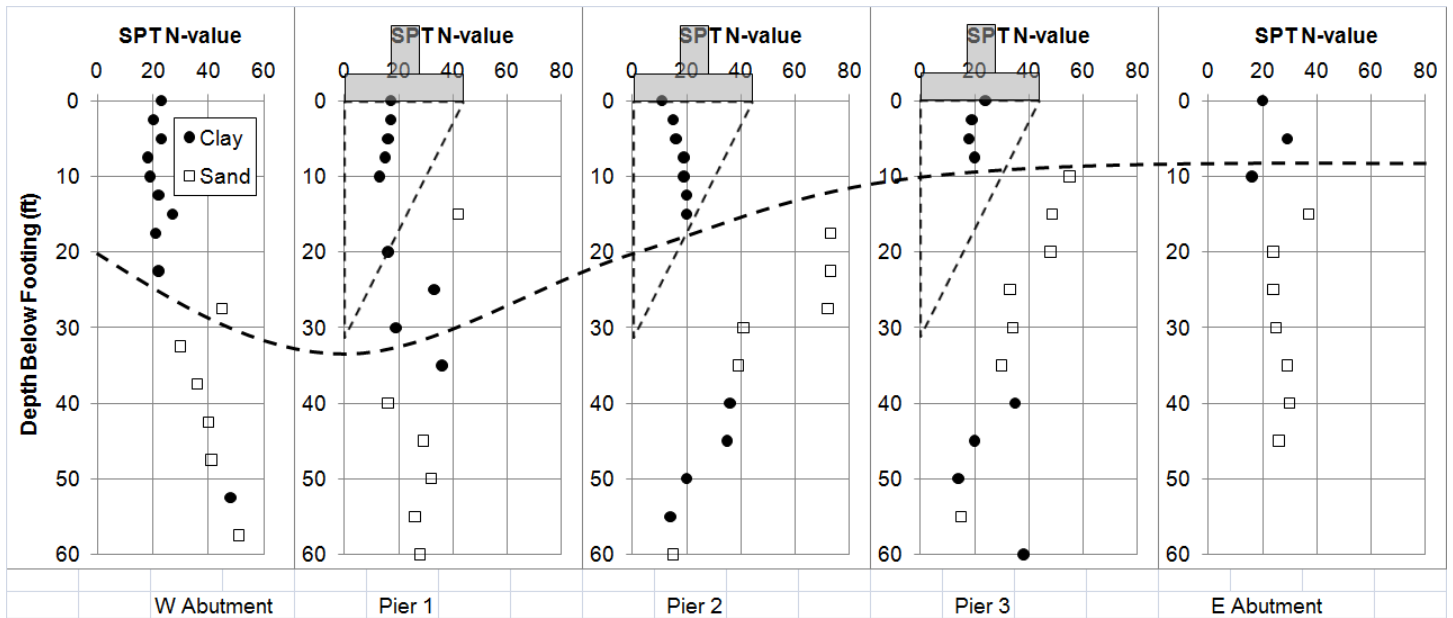


Figure 1. Soil Conditions at Site 1 (1030-20-71)



Figure 1. Instrumentation and associated equipment for Site 1 (1030-20-71)

Anticipated Work Next Quarter:

We will continue to instrument sites as they become available. Additional calibration of equipment will be performed complemented by small scale tests of instrumentation performance. Preparation of the draft report on databases of load test results will be performed.

Circumstances Affecting Progress and/or Budget:

No new circumstances this quarter.

Gantt Chart:

	Oct 2008 - Sept 2009				Oct 2009 - Sept 2010				Oct 2010 - Sept 2011				2011/2012	
Activity	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
<b>Task 1 - Literature Review / Database development &amp; interpretation</b>														
Commence Project			X											
Develop database of load tests														
Analyze existing methods														
FE parametric studies														
Develop list of potential field sites														
Assess appropriate instrumentation														
<b>Task 2 - Field monitoring and interpretation</b>														
Field testing for shallow foundations														
Field testing for deep foundations														
Field testing for lateral piles analysis														
Data compilation and analysis														
<b>Reporting</b>	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Quarterly			X	X	X	X	X	X	X	X	X	X	X	X
POT Review						X							X	
Literature Review							D	F						
Final Report													D	F

D = Draft Report; F = Final Report

Project not started until February 2009